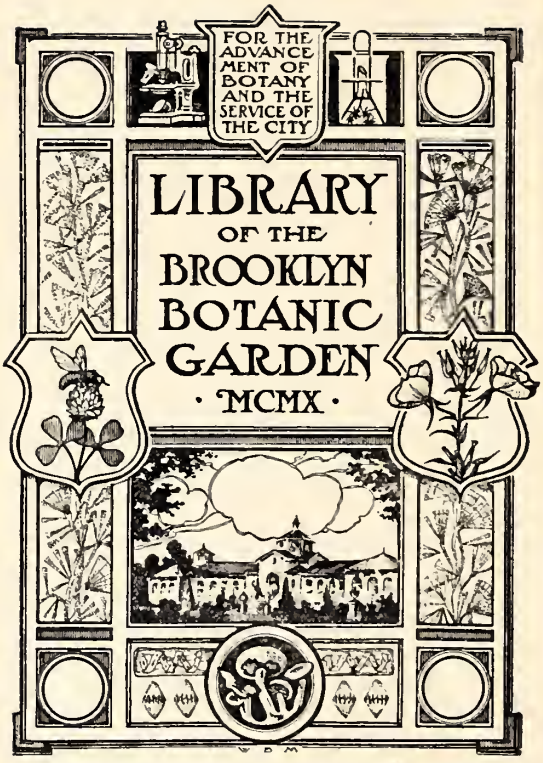

INTERNATIONAL FLOWER SHOW
EXHIBIT NUMBER

BROOKLYN BOTANIC GARDEN

LEAFLETS

SERIES XXIV BROOKLYN, N. Y., MARCH 14, 1936 No. 1

THE BROOKLYN BOTANIC GARDEN EXHIBIT OF ROCK GARDEN PLANTS *

INTERNATIONAL FLOWER SHOW

MARCH 16TH TO 21ST, 1936

Along with the increasing interest in rock gardens, greater attention is being paid to the plants used in furnishing them; therefore it is hoped that this exhibit, containing a selection of over 250 species and varieties of plants suitable for rock garden planting, will be welcomed.

It must be emphasized that the plants in the exhibit do not normally bloom all at the same time. To reduce the possibility of misconception concerning the normal time of blooming, the approximate time (based mainly on records taken in the Brooklyn Botanic Garden) is given on the labels. In order to secure sufficient variety to indicate the type of material preferred for rock garden planting it was necessary to use artificial means to bring the plants into bloom. This was done by placing them in a greenhouse for periods varying from two weeks to two months, and by increasing the length of day (for late-blooming kinds) by the use of electric light. Twelve 250 watt lights, with reflectors, were suspended over the plant benches at 3-foot intervals. The lights were turned on at dusk and shut off at 11:30 p. m. Such additional lighting is necessary because a number of plants do not respond to the correct temperature unless it is accompanied by augmented lighting to secure the right length of day. Because of severe forcing, many of the plants are not at their best; and some varieties absolutely refused to bloom no matter how we treated them. Owing to the mild weather of early winter, some plants (those which had to be brought indoors early in January) perhaps failed to receive a sufficiently long exposure to low temperatures to enable them to respond to warmth and light.

**The exhibit of the Brooklyn Botanic Garden will be found on the third floor, 46th St. side, of the Grand Central Palace, 480 Lexington Ave., Manhattan.*

With some of the plants exhibited, our problem was not how to force them into bloom but how to hold them back. Such plants as *Anemone blanda, A. oregana, Mertensia Horneri, Primula rosea, Saxifraga Boryi,* etc., evinced a tendency to open their flowers in February under cold house conditions. These precocious ones were held back by keeping them in an underground garage where the temperature remained fairly constant around 34°.

Ideal plant material for the rock garden is found among alpine plants, or among plants which possess the dwarfness and compactness characteristic of the Alpine flora. There are, however, a number of plants which should be excluded from the rock garden (even though they are dwarf and compact) because they are commonly associated with flower beds rather than with the rock garden. Examples that come to mind are portulaca, dwarf lobelia, *Alternathera,* and pansies.

The question of what is, and what is not admissible to the rock garden, is always a vexing one. The answer should be determined, in part at least, by the location of the rock garden. Those whose gardens are in regions where the cultivation of alpines does not present insuperable difficulties, should strive to furnish them in the main with genuine alpine plants: those who are so situated that the cultivation of alpines is definitely out of the question may be allowed more latitude. For examples, in southern California, cacti and succulents can be displayed effectively in a rock garden, and in the rock gardens of the Southeastern States some of the native wild flowers could appropriately find a congenial home. It must be emphasized that furnishing a rock garden is largely a matter of selecting the plants with proper discernment. One enthusiast has stated that "nothing should be grown in the rock garden that can be grown with equal ease in the flower border". There is an element of truth in this statement; for, unless inappropriate plants are excluded, there is great danger that the rock garden will lose that air of distinctiveness which is one of its chief assets, and become nothing but a flower garden planted among rocks. We have tried to keep the above considerations in mind when selecting the plants for this exhibit, which contains both true alpines, and lowland plants which we believe may be harmoniously associated with them.

The geographical origins of some of these plants form an interesting commentary on the zeal with which alpines have been sought in all corners of the globe. *Raoulia australis* comes from New Zealand; *Antennaria magellanica,* as its name implies, is native to the Magellan Strait region of South America; *Campanula Piperi* comes from the Olympic Mountains in the State of Washington; lewisias, which are among the most valuable of our native alpines, have a wide range in our western mountains; *Primula rosea,* from the Himalayas, to quote Reginald Farrer, belongs "to a race whose home is among the glaciers of the Roof of the World"; *P. Forrestii*

comes from the cliff-faces of Yunnan, a remote province in China; and *Oxalis adenophylla* is at home in the Andes. The Alps of Europe give us many of our most charming rock plants — drabas, saxifragas, primulas, etc.

A few of the rare or more interesting plants included in this exhibit are the following:

Androsace subumbellata. This is an annual which grows wild on hillsides from Hudson Bay to the Rockies. It is not by any means spectacular, but its diminutiveness confers a certain charm. It forms a tiny tuft about an inch high, with white or pink flowers an eighth of an inch in diameter. In Wyoming its time of bloom is given as "summer." Here in the Brooklyn Botanic Garden, we hitherto have treated it as a "winter annual" by sowing the seeds in July, and wintering the seedlings in the coldframe. Given such treatment, it blooms in April.

A. subumbellata is a humble relative of such showy rock plants as *A. sarmentosa* and *A. carnea,* which hail from the Himalayas and the Alps, respectively; and of *A. helvetica,* a high alpine which belongs in one of the "difficult" groups, and which every connoisseur is ambitious to grow.

Aquilegia saximontana is rare in cultivation. It grows only 2 or 3 inches high and is vastly different in appearance from hybrid columbines which grace our flower borders. It is native to high regions in the Rocky Mountains.

Leontopodium alpinum is the far-famed Edelweiss. The sight of its gray flannel-like bracts leads many to wonder why there should be so much fuss and furor about so dowdy a plant.

Lewisia rediviva is the Montana State Flower. It is one of the most widely distributed of the lewisias. The generic name commemorates Lewis of the Lewis and Clark Expedition. *L. rediviva* usually does not produce flowers until the leaves have died down.

Other lewisias represented in the exhibit include: *L. columbiana* from the Columbia River gorge, the Cascades and Blue Mountains; *L. Finchae; L. Howellii* from the peaks of the Siskiyous in northern California; and *L. rupicola,* a new species from Saddle Mountain, Clatsop County, Oregon.

Raoulia australis is grown for its mats of silvery foliage. *Raoulia* is the genus which forms the "vegetable-sheep" of New Zealand. The plants grow in hard, cushion-like masses formed of tightly packed branchlets, each surmounted by tiny, woolly leaves. From a distance the cushions are said to look like sheep.

Rosa Rouleti is the smallest rose. Of its origin nothing is known. It was introduced to cultivation by Henri Correvon. He became acquainted with it through a friend, Dr. Roulet, who found it

grown as a pot plant in the windows of cottages in the village of Mauborget in Switzerland. According to Correvon, if the plant is given manure or good earth it will increase in height and dimensions, but will keep its character as long as it does not have a rich soil. Correvon wonders if DeCandolle, the famous botanist (1778-1841), who had his garden in Champagne not far from Mauborget, grew this rose and thus provided a source for its distribution in the neighborhood.

Salix Uva-ursi is a good example of an alpine willow. It is found wild above timberline in New York and New England, and at lower altitudes from Labrador to Alaska. It is interesting to compare this tiny, trailing shrub with upstanding relatives such as the white willow and the weeping willow.

Saxifraga — encrusted varieties. A number of species belonging in this group are represented in the exhibit. They are attractive even when not in bloom, for the leaves are edged or encrusted with lime, which gives them a distinctive appearance. It is said that an abundance of lime in the soil is necessary to secure best results with this group.

Saxifraga — Kabschia varieties. These are among the most delightful rock garden plants, but are difficult to grow in the vicinity of New York. They thrive to perfection in gardens of Victoria and Vancouver, British Columbia; and also in the coastal regions of Oregon and Washington. They form compact cushions surmounted by large flowers on 1 to 5-inch stems.

Silene acaulis lives up to its name and is stemless in the Alps, while in Lapland its flowers are smaller and are carried on stems 3 to 4 inches in height. It is found high up on the mountains, growing among rocks, where soil is scarce. In the Brooklyn Botanic Garden it grows well in a mixture, 18 inches deep, of crushed stone, 5 parts; leafmold, 1 part; but it is a shy bloomer. It is worth growing, however, for its moss-like tuffets, even if it never blooms.

Statice (*Armeria*) *caespitosa* is the smallest of all Armerias. It forms compact rosettes of foliage, tightly bunched together, surmounted by practically stemless heads of silvery-pink flowers.

The "tufa" rocks, with saxifrages, sempervivums, and drabas growing directly in them, possess great sentimental interest for rock garden enthusiasts. Many of these rocks (loaned by the Poughkeepsie Nursery Company) came from the garden of the late Clarence Lown and were planted by him. Clarence Lown was one of the pioneers — if not *the* pioneer — of alpine plant culture in the United States, and his garden was for many years the mecca of lovers of alpines.

The writer wishes to express his appreciation of the untiring efforts of George Bishop, outdoor foreman of the Brooklyn Botanic Garden, in the preparation of this exhibit.

MONTAGUE FREE

BROOKLYN BOTANIC GARDEN

LEAFLETS

SERIES XXIV BROOKLYN, N. Y., JUNE 10, 1936 NO. 2

JAPANESE GARDENS AND THEIR INFLUENCE*

(Radio Broadcast over WOR, Friday, May 29, 1936)

Japanese gardens may seem remote and mysteriously romantic, yet they hold countless suggestions of practical interest for gardeners anywhere.

Upon first acquaintance, we may be intrigued with the incidental features of Japanese gardens — the picturesque lanterns, the quaint pagodas, or the amusing long-legged cranes. We recognize these as emblems of a religious and cultural background quite alien to our own, and so we are inclined to label the garden in which they are set as strange and artificial, exotically charming perhaps, but wholly irrelevant to the western world.

This superficial attitude may persist until we actually view a typical garden in Japan. Then we shall be impressed with the painting-like quality of the perfect miniature landscape before us. We will sense the skillfully placed details of the composition — the central lake, the distant hills, the flowing cascade, the moss-covered rocks. Against the restful background of broad-leaved evergreens, with their subtle interplay of lines, shades, and textures, we note small isolated accents of color in a blossoming tree or a brilliant maple, in a clump of azaleas, or a few iris growing at the edge of a stream. But these only emphasize the peace and unity of the beautiful natural scene.

Subsequent visits to other Japanese gardens will present similar landscape views. The central dominant motif may vary in each, one suggesting a seascape, another reproducing some famous historical spot, others emphasizing some special aspect of nature. The gardens may be nearly flat or quite hilly, and they vary in the degree of elaboration or informality. They range in size from the great castle gardens now converted into public parks, to the tiny tray landscapes created for indoor enjoyment.

Yet there is an important quality which most Japanese gardens have in common, a quality which makes them unique, and that is their power to induce in the onlooker a sense of utter peace and relaxation — perfect communion and harmony with nature. Even the smallest garden in Japan is self-contained and complete, shutting out the cares of a troubled world, and inviting contemplation and some thought to the things of the spirit.

The subjective mood of a Japanese garden may not fit exactly into the tempo of our American life, yet it is a note that might be worth cultivating. Since we have so much stimulation in our everyday contacts, must we always have flower-beds that are gay, colorful, and stimulating? Though it seems necessary to work hard at remaking our world to earn our daily bread, perhaps we should yield to nature in the garden, and accept her curves and contours instead of remolding her ruthlessly into geometric patterns and levelled planes. We are ambitious people, and our ambition leads us often to attempt too much. In our gardening plans, it might be worth while to emulate the Japanese sense of restraint and love of simplicity. The Japanese garden is planned to look well at all seasons without constant challenges to the owner to take out bulbs and replant bare or faded spaces.

So perhaps we will decide that not all garden space need be used for show, or exercise and play, or social or family living — that some bit at least may be reserved for a garden in the Japanese mood, as a secluded retreat for tranquil reflection. How, then, can we learn to create such a garden? For it is not feasible for us all to go to Japan for first-hand study.

Fortunately, there are in America two well-known Japanese gardens in public parks. If you live on the west coast, there is the Japanese Garden in San Francisco's Golden Gate Park. If you live in New York, you may visit the beautiful Japanese Garden in the Brooklyn Botanic Garden.

A gift from the late Alfred T. White of Brooklyn, this splendid garden was opened to the public in June, 1915. It was designed by Mr. Takeo Shiota and, for twenty-one mellowing years has been maintained by Japanese gardeners under the able supervision of Miss Mary Averill, Honorary Curator.

A visit to this lovely bit of Japan in the Brooklyn Botanic Garden is enjoyable at any time of year. This month, the wisteria is especially charming, in bloom near the lower waterfull, and entwined on the trellis roof of the tea pavilion wing. In August, the center of interest may be the lotus flourishing in the lake near the *torii*, or gate marking the water-way approach to the little hillside Inari shrine. In winter, the snow scenes are always entrancing, for the design of a carefully planned composition is more apparent when details are less noticeable. A scene of hills, island and water becomes a subtle drawing of balanced but unsymmetrically placed spaces; the snow-covered landscape is a study in dark and light, a white canvas with contrasting dusky accents in the curve of a drum bridge, the straight lines of a sturdy stone lantern, a somber mass of evergreens.

Such picturesque scenes are readily enjoyed by anyone. But if they are to be really appreciated and understood, some study of the history of Japan's landscape art is necessary. For the Brooklyn Japanese Garden is a composite garden, showing characteristics of the early gardens as borrowed from China in 600 A. D., as well as features derived from later influences in Buddhist and Shinto temple gardens, and gardens designed by the artistic devotees of the tea cult ceremonies.

In this short talk, we cannot trace the development of Japanese landscape art through thirteen centuries, or explain the meaning of a myriad of fascinating symbolic names like "Guardian Stone," "Moon View Pavilion" or "Honorable Deity Lantern." Nor can we analyze the inherent principles of design which elevate Japanese gardening to the rank of a fine art.

But this information is available, happily, in a book written in 1935 by T. Tamura, Doctor of Forestry in Japan, and dedicated to the members of the Garden Club of America, in commemoration of their visit to Japan last spring. As other reliable books in English, on Japanese gardening are out of print, the publication of Dr. Tamura's volume is most timely.

A study of Japanese landscape art is helpful not only to those who wish to reproduce Japanese-style gardens in this country, but to creators of naturalistic gardens anywhere. We may feel limited as to space and materials. But the Japanese teach us to make the most of our natural resources and to create an illusion of space in the tiniest area. These methods are not secret oriental tricks, but the faithful adherence to universally known aesthetic rules of design. Proper scale and proportion give depth and perspective to shallow spaces, careful disposition of forms gives variety and harmony with even the simplest materials. For the Japanese ideal is a suggestive, not a realistic garden. With skill and understanding we can use our native evergreen trees, shrubs, or potted plants, our local rocks, stones, gravel, or sand, and especially our free-flowing water, to create miniature landscapes which will be logical in the American setting. If these breathe peace and serenity, they will have spiritual kinship with the gardens of Japan.

Dorothy Meigs Eidlitz

NOTICES

The Brooklyn Botanic Garden is open free to the public daily, from 8 a. m. until dusk. It is open on Sundays and holidays, during the summer months, from 10 a. m. until 7 p. m.; at other times from 10 a. m. until dusk. The Laboratory Building, containing the Library, Herbarium, and offices, is open daily (except Sundays), from 9 a. m. until 5 p. m. (Saturdays, 9-12). The Conservatories are open April 1-September 30, 10 a. m.-4:30 p. m. (Sundays, 2-4:30); October 1-March 31, 10 a. m.-4 p. m. (Sundays, 2-4). **The Japanese Garden** is open, beginning on the second Wednesday in May until November, every weekday from 11 a. m. until dusk; on Sundays and holidays from 1 p. m. until dusk. **The Rose Garden** is open from 9 a. m. to 5 p. m. on weekdays. It is closed on Sundays and holidays.

The Garden may be reached in the following ways: **By Trolley;** Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue or Lorimer Street Trolleys to Flatbush Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Ninth Avenue, Union Street, Vanderbilt Avenue, or Smith Street trolleys to Grand Army Plaza and Union Street. **By Subway;** Brighton Beach Express, Broadway (B.M.T.) Subway to Prospect Park (north exit). From Pennsylvania Station, Manhattan, take Broadway-Seventh Avenue Subway to Eastern Parkway-Brooklyn Museum Station. From Grand Central Station, Manhattan, take Lexington Avenue Subway, changing at Nevins Street, Brooklyn, to Broadway-Seventh Avenue Subway, getting off at Eastern Parkway-Brooklyn Museum Station. **By Automobile;** from points on Long Island, take Eastern Parkway and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

Entrances—On Flatbush Avenue (1) near Empire Boulevard, and (2) near Mt. Prospect Reservoir; on Washington Avenue, (3) south of Eastern Parkway, and (4) near Empire Boulevard; on Eastern Parkway, (5) west of the Museum building.

The Street entrance to the Laboratory Building is at 1000 Washington Avenue, between Eastern Parkway and Empire Boulevard and opposite Crown Street.

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Telephone: Prospect 9-6173. Mail address: Brooklyn Botanic Garden, 1000 Washington Avenue, Brooklyn, N. Y.

BROOKLYN BOTANIC GARDEN

LEAFLETS

SERIES XXIV BROOKLYN, N. Y., DECEMBER 9, 1936 NO. 3-5

THE RARE TREES AND SHRUBS OF KISSENA* PARK, FLUSHING, L. I., N. Y.

From 1872 to shortly before 1907 the best part of the land now included in Kissena Park was occupied by the nursery of S. Parsons & Sons Co. The senior partner of that firm, Samuel Bowne Parsons, was one of the most active and discriminating of those horticulturists of his time who introduced oriental trees and shrubs into this part of the country. When the firm of "S. Parsons & Sons Co." closed out their business, the land was eventually acquired by the City of New York.** It seems correct to state that Kissena Park is about 38 years old.

The City of New York acquired with the land many trees and shrubs, which in most cases are still standing where they were left when the Parsons nursery closed out. The most interesting of these plants are concentrated in a space of about 20 acres, or less than one-third of the official acreage of the Park. The Maples and the Magnolias form a collection which rivals that of many botanic gardens: we shall deal with these groups first.

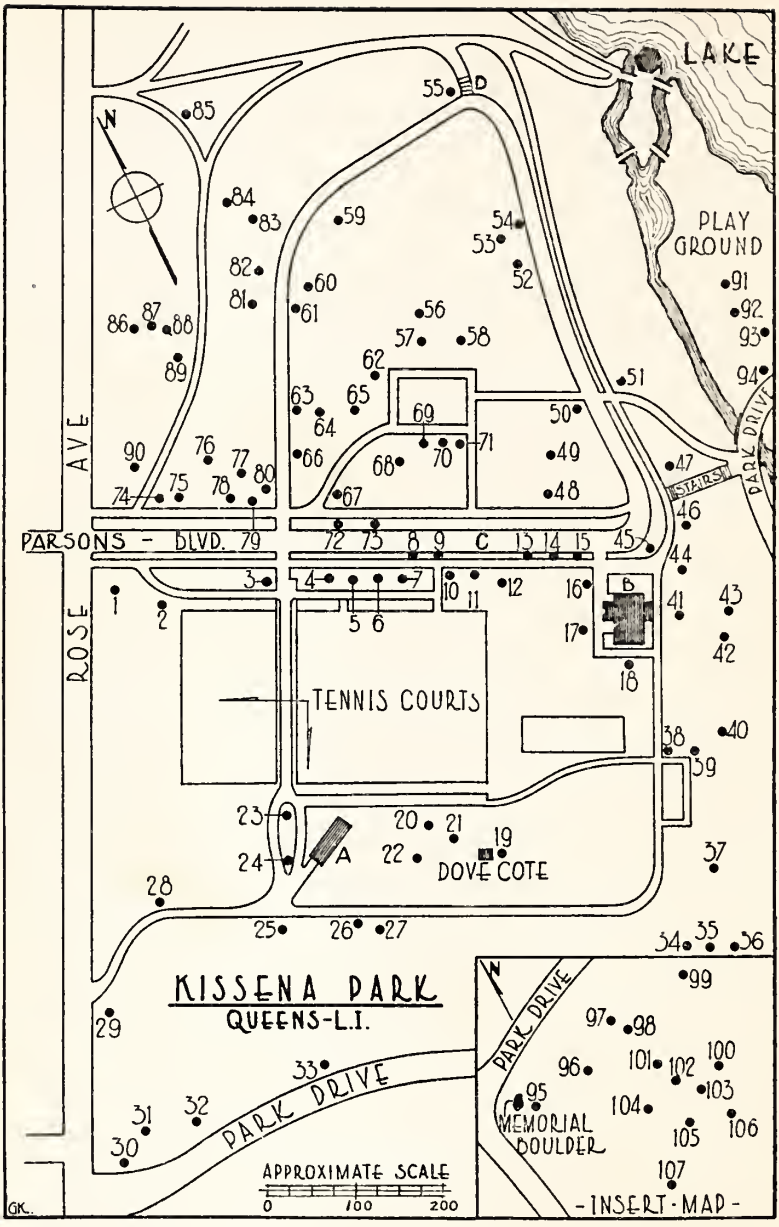
Past the two White Pines (*Pinus Strobus*, unnumbered)† at the entrance of Kissena Park on Rose Avenue, facing Parsons Boulevard, we see at the right two large Maples, respectively the Coliseum Maple (*Acer cappadocicum*, No. 1)††, and a hairy form of the Painted Maple (*Acer pictum* var. *ambiguum*. No. 2). Crossing the service road to the north side, we come upon a row of Cutleaf Japanese Maples (*Acer palmatum* var. *septemlobum*, No. 78), which ends toward the southeast, i. e., away from Rose Avenue, with a Japanese Maple (*Acer palmatum* var. *Thunbergii*, No. 79). A trifle in back of this tree and to the right, grows the Fernleaf Maple (*Acer japonicum* var. *Parsonsii*, No. 80). Facing it across two paths

* Kissena was the name of the chieftain of the Indian tribe occupying this area in pre-Colonial times.

** The author wishes to thank Miss A. H. Parsons, Miss Mabel Parsons, and Mr. J. Gatringer for their kind communication of data, here unfortunately much abridged, concerning the Parsons nurseries.

†The Manual of Cultivated Trees and Shrubs, by Alfred Rehder, published in 1934, is the standard work upon which this popular account is based for the nomenclature.

††The numbers correspond to those on the map, Page 2.



Map of part of Kissena Park, Flushing, N. Y., showing the locations of the more important trees and shrubs. The numbers correspond to those on the opposite page. A, office; B, comfort station; C, service road; D, arbor. The walk parallel to Rose Avenue, ending north of tree No. 85, is still under construction.

In the following list, the numbers correspond to those on the map on the opposite page.

1. Acer cappadocicum
2. Acer pictum var. ambiguum
3. Diospyros virginiana
4. Acer platanoides var. palmatifidum
5. Acer Pseudoplatanus var. purpureum
6. Acer Pseudoplatanus var. Dittrichii
7. Acer Trautvetteri
8. Acer Pseudoplatanus var. Leopoldii
9. Acer Sieboldianum
10. Acer palmatum var. Thunbergii
11. Acer japonicum
12. Acer palmatum var. linearilobum
13. Cornus Kousa
14. Acanthopanax septemlobus
15. Syringa pekinensis
16. Aesculus Hippocastanum
17. Acer platanoides var. Schwedleri
18. Larix Kaempferi
19. Viburnum pubescens
19. Viburnum scabrellum
20. Evonymus latifolia
21. Evonymus Bungeana
22. Ulmus foliacea
23. Tilia mandshurica
24. Tilia Moltkei
25. Magnolia macrophylla
26. Oxydendrum arboreum
27. Phellodendron chinense
28. Acer campestre
29. Tilia glabra
30. Alnus rugosa
31. Chionanthus virginica
32. Fraxinus nigra
33. Gleditsia triacanthos
34. Fraxinus Biltmoreana
35. Morus australis
36. Cedrela chinensis
37. Carpinus japonica
38. Maackia amurensis
39. Syringa japonica
40. Parrotia persica
41. Magnolia acuminata
42. Magnolia denudata
43. Tilia neglecta
44. Ulmus fulva
45. Evonymus oxyphylla
46. Viburnum tomentosum
47. Fagus grandifolia
48. Corylus Avellana
49. Phellodendron Levallei
50. Acer platanoides var. laciniatum
51. Celtis pumila
52. Magnolia Kobus
53. Magnolia Thompsoniana
54. Magnolia Soulangeana var. Lennei
55. Pueraria Thunbergiana
56. Halesia carolina
57. Wistaria floribunda
58. Wistaria chinensis
59. Acer Negundo
60. Quercus dentata
61. Campsis radicans
62. Photinia villosa
63. Magnolia tripetala
64. Magnolia obovata
65. Symplocos paniculata
66. Fagus sylvatica var. laciniata
67. Acer palmatum var. septemlobum rubrum
68. Hamamelis virginiana
69. Zelkova serrata
70. Gleditsia triacanthos var. inermis
71. Phellodendron chinense
72. Evonymus alata
73. Styrax japonica
74. Fagus sylvatica var. quercifolia
75. Fagus sylvatica
76. Cercidiphyllum japonicum
77. Quercus robur
78. Acer palmatum var. septemlobum
79. Acer palmatum var. Thunbergii
80. Acer japonicum var. Parsonii
81. Tilia cordata; (Tilia euchlora)
82. Nyssa sylvatica
83. Elcagnus umbellata
84. Amelanchier canadensis
85. Quercus bicolor
86. Ulmus parvifolia
87. Quercus lanuginosa
88. Quercus robur var. heterophylla
89. Styrax Obassia
90. Juglans cinerea
91. Taxodium distichum
92. Taxodium ascendens
93. Taxodium distichum
94. Aesculus carnea
95. Abies Veitchii
96. Taxus cuspidata
97. Pinus resinosa
98. Quercus palustris
99. Pinus cembra
100. Quercus robur
101. Abies lasiocarpa
102. Abies concolor
103. Pseudotsuga taxifolia
104. Pinus sylvestris
105. Abies homolepis
106. Quercus alba
107. Thuja occidentalis

that run northward and eastward respectively, and quite inconspicuous among Beeches and Magnolias, lives a slender Red Cutleaf Japanese Maple (*Acer palmatum* var. *septemlobum rubrum*, No. 67) which will not maintain itself long if it is allowed to stay where we now see it. Returning to the southern side of the service road we spy, one after the other, a Cutleaf Norway Maple (*Acer platanoides* var. *palmatifidum*, No. 4), a large three-headed Norway Maple (*Acer platanoides*, unnumbered), four Purple Sycamore Maples (*Acer Pseudoplatanus* var. *purpureum*, No. 5), having leaves purplish underneath, two Dittrich's Sycamore Maples (*Acer Pseudoplatanus* var. *Dittrichii*, No. 6), and one Redbud Maple (*Acer Trautvetteri*, No. 7), with large brownish buds. Two Maples that resemble this last very much, but have more deeply cut leaves, stand west of the garage (not on map, but south of the inset plan showing the Memorial Knoll). These are Balkan Maples (*Acer Heldreichii*). In the planting strip across the walk from the Redbud Maple is set a Leopold Maple (*Acer Pseudoplatanus* var. *Leopoldii*, No. 8), and by it a Siebold's Maple (*Acer Sieboldianum*, No. 9). The leaf of this tree suggests a roundish fan, and resembles that of the Fullmoon Maple (*Acer japonicum*, No. 11, nearby,) represented by two much-crowded trees that are probably the best to be found in this part of the country. Quite close to them grow several Japanese Maples (*Acer palmatum* var. *Thunbergii*, No. 10). These small-leaved forms are believed by botanists to represent a common kind of the Japanese Maple that is found wild in Japan.

Before leaving this Maple paradise we need notice two other trees. Facing Dittrich's Sycamore Maple, right at the fence of the tennis court, is set a Cutleaf Japanese Maple (*Acer palmatum* var. *septemlobum*, unnumbered), which but for the green color and the slightly deeper cuts between the lobes of the leaf, matches the varieties and forms of the Japanese Maple previously described, Nos. 67 and 78. A Feathery Japanese Maple (*Acer palmatum* var. *linearilobum*, No. 12) stands isolate on the walk. As the botanical name implies, its leaves are quite linear—in fact, almost thread-like.

Well north of the comfort station grows a Bentleaf Norway Maple (*Acer platanoides* var. *laciniatum*, No. 50), several of which are also planted along the shuffle-board courts. A Schwedler Maple (*Acer platanoides* var. *Schwedleri*, No. 17), with leaves which are reddish early in the season, is near the comfort station. Somewhat left of the office grows a single tree of the Hedge Maple (*Acer campestre*, No. 28) and a Boxelder, (*Acer Negundo*, No. 59) stands in the northern part of the grounds.

The Magnolias are of nine different kinds. The Umbrella Magnolia (*Magnolia tripetala*, No. 63) is a common tree, or shrub. The Silver Magnolia (*Magnolia obovata*, No. 64) is rare, and our specimen perhaps sets a record for size. The Umbrella Magnolia and the Silver Magnolia can easily be confused. The former, how-

ever, has a leaf that tapers to the base, a long pointed bud, and a pink, smooth fruit. The Thompson Magnolia (*Magnolia Thompsoniana*, No. 53) resembles a diminutive Cucumber Magnolia. Of this extremely rare Magnolia two trees are alive: one other, nearby, is dead. No effort should be spared to save and to propagate the specimens that are still alive. The Lenne Magnolia (*Magnolia Soulangeana* var. *Lennei*, No. 54), a late bloomer with comparatively large leaves; the Kobus Magnolia (*Magnolia Kobus*, No. 52), with smaller leaves and very hairy buds; the Saucer Magnolia (*Magnolia Soulangeana*, unnumbered, at the southwestern corner of the grove), too well known to call for comment, are in the vicinity of the Thompson Magnolias, together with Umbrella Magnolias and Yulans. A fairly large Yulan (*Magnolia denudata*, No. 42), and several Cucumber Magnolias (*Magnolia acuminata*, No. 41) thrive east of the comfort station. The Yulan has large, pure white flowers; the Cucumber Magnolia, which is the largest of our native Magnolias, has greenish flowers, the petals of which fall promptly. Two spindly Bigleaf Magnolias (*Magnolia macrophylla*, No. 25) give a somewhat sorry account of themselves south of the office. Their leaves are large, and their fruits roundish egg-shaped.

Many Beeches in Kissena Park belong to the American species (*Fagus grandifolia*, No. 47, and elsewhere). The European species is represented by the common form (*Fagus sylvatica*, No. 75), by the Oak-leaf variety (*Fagus sylvatica* var. *quercifolia*, No. 74, the first tree west in the row), by the Cutleaf variety (*Fagus sylvatica* var. *laciniata*, No. 66), and by a light-colored specimen of the Purple Beech (*Fagus sylvatica*, var. *atropunicea*, unnumbered, north of No. 45). The Oaks are few if the native species are excluded from the reckoning. Fennessey's Oak (*Quercus robur* var. *heterophylla*, No. 88, and in the grove, south of No. 69) is a baffling sport of the English Oak, with irregular, spear-shaped leaves. The European Pubescent Oak (*Quercus lanuginosa*, No. 87) is next to it. It resembles the English Oak, but its twig is finely hairy. The English Oak (*Quercus robur*, No. 77) is abundant in the grounds, and handsomely identified by its oftentimes pendent, long-stalked cups. The Daimyo Oak (*Quercus dentata*, No. 60) is an Asiatic species that appears to be doing none too well in this environment. Its cup is long-bristly all over. A last Oak is located on our map, way up north, the Swamp White Oak (*Quercus bicolor*, No. 85), which happens to be a spindly specimen with "weeping" branches, the only one of its kind on high ground in the Park. Mention also may be made of the Golden English Oak (*Quercus robur* var. *concordia*, unnumbered, south of No. 71), a variety that has yellowish leaves in spring.

The Elm family is represented by the Chinese Elm (*Ulmus parvifolia*, No. 86), which blossoms in the fall and should indeed not be confused with the Siberian, or Dwarf Asiatic Elm found in many parks in our City. A Smoothleaf Elm (*Ulmus foliacea*,

No. 22, near the dovecote) belongs to the form of this very variable species which is best for planting under city conditions. The Slippery Elm (*Ulmus fulva,* No. 44, near the comfort station), is used but little for landscaping. It resembles the Scotch Elm (*Ulmus glabra,* which is not in the park), but in the latter species the winter twig is brown, not gray. The American Elm (*Ulmus americana*) is found often in the park, and needs no description. A tree with light brown bark, the leaf of which suggests an Elm, or perhaps to some, a Hornbeam, is the Sawleaf Zelkova (*Zelkova serrata,* No. 69), from Japan. The Lesser Hackberry (*Celtis pumila,* No. 51) should not deserve notice except that the specimen is bigger than usual for the species, which is frequently described as only a large shrub.

The Olive Family has some worth while specimens in Kissena Park. White or American Ashes (*Fraxinus americana*) are fairly common all over the grounds. Biltmore Ashes (*Fraxinus biltmoreana,* No. 34), conspicuous on account of their corky bark, stand in a row at the south of the ground shown on the map. Also at the south grow several gaunt and much battered Black Ashes (*Fraxinus nigra,* No. 32) which, but for the large black bud and opposite leaves could be mistaken for Walnuts. The Peking Lilac (*Syringa pekinensis,* No. 15) is a fine specimen. Its spear-shaped leaves distinguish it at a glance from the less beautiful Japanese Tree Lilac (*Syringa japonica,* No. 39). A native shrub, the fruit of which is shaped like an olive, the White Fringetree (*Chionanthus virginica,* No. 31), gives a poor account of itself. Its leaves are simple, opposite. It will be found at the entrance to the Park Drive, near the southwest corner of the land shown on the map.

The Pea Family may not be proud of several Amur Maackias (*Maackia amurensis,* No. 38) which figures as "new and rare" in the Parsons catalogues. The trees have a peculiar yellow-brown smooth bark and no beauty. Thorny and tall Honey Locusts (*Gleditsia triacanthos,* No. 33), are offset by a specimen of the Thornless Honey Locust (*Gleditsia triacanthos* var. *inermis,* No. 70). Three vines of the Pea Family deserve mention: the Chinese Wistaria (*Wistaria chinensis,* No. 58), and the Japanese Wistaria (*Wistaria floribunda,* No. 57) are near together and can be compared at ease; the Kudzu-bean (*Pueraria Thunbergiana,* No. 55) covers several square yards of ground at the arbor in the north part of the Park.

The Rose Family is represented by only a few species. There are mature specimens of Photinia (*Photinia villosa,* No. 62), still standing here and there in the original row. The red berries of these shrubs are avidly eaten by birds which sow them all around. A lovely Pearlbush (*Exochorda racemosa,* unnumbered, southeast of No. 83) displays, in fall and winter, fruits that are like diminutive apples minus the pulp. The Shadbushes (*Amel-*

anchier canadensis, No. 84) are disappointing—just a row of spindly plants. Their smooth, grayish bark, resembling the Hornbeam's, is characteristic.

A freakish Linden consists of several large heads of the Littleleaf European Linden (*Tilia cordata*, No. 81), surrounding a single-stemmed Crimean Linden (*Tilia euchlora*). The latter was grafted, as usual, on the former, but the stock having greater vitality than the scion is coming back strongly at the root. A puzzling form, probably the Gray Linden (*Tilia neglecta*, No. 43), grows east of the comfort station, and should be identified definitely when bearing fruit. Near the office thrives a superb Manchurian Linden (*Tilia mandshurica*, No. 23)—a kind not often seen in cultivation. South of this tree stands Moltke's Linden (*Tilia Moltkei*, No. 24), which is a hybrid between the Basswood and the Silver Linden. Of the Basswood (*Tilia glabra*, No. 29) a remarkably small-leaved form grows to the southwest of the office.

The Staff-Tree Family boasts a very rare species, the Cherry Staff-tree (*Euonymus oxyphylla*, No. 45). This neat shrub from the Far East has fruits which are round at first, but later open by four or five valves. The Winged Euonymus (*Euonymus alata*, No. 72), also from the Far East, has cork-winged twigs. Poorly preserved but very large is the Winterberry Euonymus (*Euonymus Bungeana*, No. 21) near the dovecote. The long petioles of its leaves identify it easily. The Broadleaf Burningbush (*Euonymus latifolia*, No. 20) is better known by its liability to become—and to remain—infested with scale insects than by any other character.

The Corktrees of Kissena Park do not bear fruit, and the identification is made doubtful thereby. It is permissible to state, however, that the Chinese Corktree, (*Phellodendron chinense*, No. 71 and No. 27, respectively the narrow and broad-leaved forms) is represented. The stiff, Levallee's Corktree (*Phellodendron Levallei*, No. 49) is not far from No. 71. In the row of young plants east from Levallee's Corktree, the second and fifth specimens, north to south, appear to be Japanese Corktrees (*Phellodendron japonicum*, unnumbered). All these species have a peculiar odor of leaf and wood.

The Asiatic Sweetleaf (*Symplocos paniculata*, No. 65) is a shrub that stands in a botanic family by itself, and yields in late summer blue berries which are more effective in the garden than the small white flowers borne in the spring. The Storax Family numbers the Japanese Snowbell (*Styrax japonica*, No. 73), the bark of which shreds and flakes off easily, and another large-leaved species, also from Japan, the Fragrant Snowbell (*Styrax Obassia*, No. 89). Our native Great Silverbell (*Halesia carolina*, No. 56) has peculiar four-winged fruits, and crevices in the bark that are orange colored at bottom.

The Viburnums are interesting at one point, near the dovecote. There grow two blue-berried native species of Arrow-wood (*Viburnum pubescens* and *Viburnum scabrellum*, No. 19), which can be easily distinguished in fruit, but not otherwise. They should be seen at mid-September, at which time the *Viburnum scabrellum* is seen carrying larger berries. The Siebold Viburnum (*Viburnum Sieboldii*, unnumbered) is a large shrub with opposite leaves near Siebold's Maple, No. 9. The Doublefile Viburnum (*Viburnum tomentosum*, No. 46) has young twigs and leaves that have an orange "scurf".

The rest of the trees and shrubs of Kissena Park are individually distributed among various families. A common Butternut (*Juglans cinerea*, No. 90) is not far from a row of Katsura-trees (*Cercidiphyllum japonicum*, No. 76) which have round leaves, and opposite or subopposite buds. A European Hazelnut or Filbert (*Corylus Avellana*, No. 48) occupies the center of the lawn north of the comfort station. In the vicinity, and to the west, may be sought in the grove a good specimen of Witch-hazel (*Hamamelis virginiana*, No. 68). The peculiar Castor-aralia (*Acanthopanax septemlobus*, No. 14) is represented by several trees. At a casual glance they might be taken for Maples, but their prickly trunks and branches, with alternate leaves, tell a different story. The Kousa Dogwood nearby (*Cornus Kousa*, No. 13) is promptly distinguished from the Flowering Dogwoods (*Cornus florida*, common on the grounds) by its smooth bark, flaky here and there. A Japanese Larch (*Larix Kaempferi*, No. 18) is near the comfort station, and the two trees like it, just across the walk, are European Larches (*Larix decidua*, unnumbered). The very large shrub in the lawn southeast of these Larches represents one of the best Parrotias (*Parrotia persica*, No. 40) to be seen in Greater New York. Its relationship to the Witch-hazel is evident if only its leaf and flowerbud be studied. A large Chinese Cedrela (*Cedrela chinensis*, No. 36), together with smaller trees of the same species, stands near the Biltmore Ashes. The Mulberry near the Cedrela may be one of the most interesting trees of the whole Park, for it appears to be the Southern Mulberry (*Morus australis*, No. 35). The White Mulberry (*Morus alba*, unnumbered, south of the western tennis-court) has leaves less closely veined. The Japanese Hornbeam (*Carpinus japonica*, No. 37) is a poor specimen, the fruit of which is like that of our native Hop-hornbeam. Its leaves are longer than those of the Hornbeam (*Carpinus caroliniana*, found here and there on the lower grounds).

Along the walk at the south slope, near the Chinese Corktrees, No. 27, are planted several rough-barked Sourwoods (*Oxydendrum arboreum*, No. 26), carrying "hanks" of fruits which, each of itself, suggests the fruit of the Rhododendron. In fact, both Sourwoods and Rhododendrons are members of the Heath Family. From the Sourwoods, a tireless visitor can walk down the slope, and behold planted in a pit several Common Alders (*Alnus*

rugosa, No. 30). Few trees of the kind in our vicinity are as large as these. And steering northward for a final sprint the lover of plants will be rewarded with the sight of a Common Persimmon (*Diospyros virginiana*, No. 3), which bears fruit heavily. North of this tree a fair-sized Trumpet Creeper (*Campsis radicans*, No. 61), and a fine Tupelo (*Nyssa sylvatica*, No. 82) add to the number of the native species growing in Kissena Park. Lastly an Oleaster (*Eleagnus umbellata*, No. 83), with leaves silvery underneath, brings September offerings of pleasingly acid berries, if only one can beat the birds to them.

The playground east of the area just described has four trees worth notice: two feathery Bald Cypresses (*Taxodium distichum*, No. 91 and 93), a Pond Cypress with thread-like leaves (*Taxodium ascendens*, No. 92), and Red Horsechestnuts (*Aesculus carnea*, No. 94.) Other trees farther east are European Horsechestnuts (*Aesculus Hippocastanum*, with sticky buds, unnumbered. See also No. 16, west of the comfort station).

The Memorial Knoll (inset map) offers two large American Arbor-vitae (*Thuja occidentalis*, one No. 107, the other unnumbered). Near a tall Pin Oak (*Quercus palustris*, No. 98) is planted a small Red Pine (*Pinus resinosa*, No. 97) having rather soft needles and orange-colored new twigs. A very poor 5-needled Pine at the extreme left appears to be the Swiss Stone Pine (*Pinus cembra*, No. 99). From the so-called "White Oak" (to all appearances an English Oak, *Quercus robur*, No. 100) inscribed to the memory of William A. Leonard, one spies, looking downhill, two western Firs, the White Fir (*Abies concolor*, No. 102) and the Rocky Mountain Fir (*Abies lasiocarpa*, No. 101), which is seldom seen hereabouts. A Douglas-fir (*Pseudotsuga taxifolia*, No. 103) in the vicinity is promptly identified by its large, pointed buds. Standing at the White Oak (*Quercus alba*, No. 106) dedicated to Theodore Roosevelt, and looking generally in a westward direction, one recognizes at first sight the Nikko Fir (*Abies homolepis*, No. 105), which has an open habit, and peculiar short, stiff needles set singly upon a hairless, pale yellow, finely grooved twig. A Scotch Pine (*Pinus sylvestris*, No. 104) is also of easy identification on account of its short, bluish, twisted needles growing in pairs. Down at the Memorial Boulder grow two Veitch Firs (*Abies Veitchii*, No. 95), the leaves of which have conspicuous white bands underneath, and just across the lawn from the Boulder, going uphill, rises a line of Japanese Yews (*Taxus cuspidata*. One of them is No. 96).

As will be readily seen from the foregoing brief outline, the collection of trees and shrubs at Kissena Park contains a large number of rare and interesting species. It is possible, if not probable, that many of the rare trees in Central and Prospect Parks were derived from Kissena Park when it was occupied by the Parsons Nurseries. Possibly, also, some of them came from the older Prince Nursery of Flushing.

We know of no similar area in Greater New York, with the exception of course of the plantations of the two botanic gardens, where a like aggregation of rare species may be found. Since this is so, it is of the utmost importance to the public and to science that this collection be maintained and preserved in its entirety.

Notes on the Horticultural History of Flushing

Even the casual traveler through the Flushing of today cannot fail to notice on every side evidences that the town during its development has had a rich horticultural background. Such names for avenues as Negundo, Kalmia, Laburnum, etc.; rare trees in yards and sometimes even on street fronts;[1] a specimen of the Weeping Beech (*Fagus sylvatica pendula*) which is probably the largest in America, are part of this evidence.

As a matter of fact, the old town of Flushing may claim rightful title as one of the historic centers of horticulture in the United States. "The first independent general nursery in the new world, in the sense in which we now understand the term, appears to have been that established by William Prince at Flushing, Long Island, . . . which was continued under four generations of the same family."[2] This nursery was established about 1727. "The 22nd edition of its catalogue, published in 1823, 'Practical horticulture being in that day quite a novelty in America' (as the preface states) lists 90 kinds of grapes, 114 apples, 107 pears, 53 cherries, 74 peaches, 48 plums, 55 gooseberries, 254 roses, and 330 *ornamental trees and shrubs.*"[3]

From the time of the establishment of this nursery until 1907, succeeding generations of gentleman-dealers, among whom the Princes and the Parsons stand foremost, introduced to Flushing, and therefore to America, the choicest horticultural varieties from Europe and Asia. In addition, they developed their own varieties of useful and ornamental plants. Exhaustive as is the literature of horticulture today, we still do not know the entire history of the Princes' interests.

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[1] Mrs. E. P. Martin, the wife of the late E. P. Martin, who devoted a large part of his life to the interests of Flushing and its trees, has compiled a list of the trees of Flushing, giving their locations. Published by the Nature Committee of the Good Citizenship league, of Flushing.

[2] Bailey, L. H. Standard cyclopedia of horticulture, Vol. III, p. 1517. 1925.

[3] From "The school of horticulture in perspective," an address by Dr. C. Stuart Gager at the twenty-fifth anniversary exercises of the School of Horticulture for Women, Ambler, Pa., May 20, 1936. *Science* N.S. **84**: 357-365. 1936.

The lives of two master-horticulturists cover the golden era of Flushing as a horticultural center. It is fitting that both of them here be briefly recorded. William Prince (1766-1842), third in a line of public-spirited citizens, claims in his "Short treatise on horticulture" (1828) to have introduced from London the Tree-of-Heaven (*Ailanthus altissima.*) To W. Prince,[1] as a botanist, should be given credit for *Magnolia Thompsoniana*, the authorship of which is currently credited to C. S. Sargent, who to all appearances described (Gard. For. 1:268, 269. 1888) only an offspring from the stock much earlier introduced by W. Prince. It is safe to assume that not more than two or three years lapsed between the birth of a horticultural novelty in Europe and its representation in the nursery of W. Prince. In the same spirit he kept an eye on the activities of the expeditions sent to explore the Far West; and the Prince nurseries contained many species collected by these early American explorers[2].

S. B. Parsons (1819-1906) was born when W. Prince was active, and his death caused the liquidation of the Kissena Nursery, thus ending the primacy of Flushing in commercial horticultural matters. S. B. Parsons hired his own collectors to gather trees and shrubs of the Far East, and to him we owe the production of a notable variety of the Fullmoon Maple (*Acer japonicum*), not to mention the introduction of many species of Chinese, Japanese, and Near East origin.

LEON CROIZAT

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[1]Prince, W. A short treatise on horticulture. p. 82. New York, N. Y. 1828.

[2]The following shows how widely known W. Prince was in the America of 100 years ago.

Dr. C. Stuart Gager, Director of the Brooklyn Botanic Garden, states that about 25 years ago, in the course of a conversation with Mrs.Henry, aged 85, a granddaughter of W. P. Prince, and therefore a great-granddaughter of W. Prince, she remarked that a letter from England addressed to "William Prince, America," was delivered to him in Flushing!

NOTICES

The Brooklyn Botanic Garden is open free to the public daily, from 8 a. m. until dusk. It is open on Sundays and holidays, during the summer months, from 10 a. m. until 7 p. m.; at other times from 10 a. m. until dusk. The Laboratory Building, containing the Library, Herbarium, and offices, is open daily (except Sundays), from 9 a. m. until 5 p. m. (Saturdays, 9-12). The Conservatories are open April 1-September 30, 10 a. m.-4:30 p. m. (Sundays, 2-4:30); October 1-March 31, 10 a. m.-4 p. m. (Sundays, 2-4). **The Japanese Garden** is open, beginning on the second Wednesday in May until November, every weekday from 11 a. m. until dusk; on Sundays and holidays from 1 p. m. until dusk. **The Rose Garden** is open from 9 a. m. to 5 p. m. on weekdays, from May until November inclusive.

The Garden may be reached in the following ways: **By Trolley;** Flatbush Avenue trolley to Empire Boulevard; Franklin Avenue or Lorimer Street Trolleys to Flatbush Avenue; St. John's Place trolley to Sterling Place and Washington Avenue; Ninth Avenue, Union Street, Vanderbilt Avenue, or Smith Street trolleys to Grand Army Plaza and Union Street. **By Subway;** Brighton Beach Express, Broadway (B.M.T.) Subway to Prospect Park (north exit). From Pennsylvania Station, Manhattan, take Broadway-Seventh Avenue Subway to Eastern Parkway-Brooklyn Museum Station. From Grand Central Station, Manhattan, take Lexington Avenue Subway, changing at Nevins Street, Brooklyn, to Broadway-Seventh Avenue Subway, getting off at Eastern Parkway-Brooklyn Museum Station. **By Automobile;** from points on Long Island, take Eastern Parkway and turn left at Washington Avenue; from Manhattan, take Manhattan Bridge, follow Flatbush Avenue Extension and Flatbush Avenue to Eastern Parkway, turn left following Parkway to Washington Avenue; then turn right.

Entrances—On Flatbush Avenue (1) near Empire Boulevard, and (2) near Mt. Prospect Reservoir; on Washington Avenue, (3) south of Eastern Parkway, and (4) near Empire Boulevard; on Eastern Parkway, (5) west of the Museum building.

The Street entrance to the Laboratory Building is at 1000 Washington Avenue, between Eastern Parkway and Empire Boulevard and opposite Crown Street.

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BROOKLYN BOTANIC GARDEN

LEAFLETS

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THE TERRARIUM

A pleasing hobby for the winter months is the making and care of a terrarium, for in this way a favorite bit of woodland or a miniature greenhouse may be brought into the home or school room. Terraria are inexpensive to make and easy to look after.

The container

The first consideration is a container. This should be of clear glass with a glass top. A rectangular two-gallon aquarium is a convenient size, although a larger one of six gallons or more gives greater scope for originality of arrangement and choice of plants; but even a very small container such as a fruit jar with a bit of moss and a wild fern or two is worth having. Round bowls filled with partridge berries or other material are pretty, but the curved glass reflects and distorts the light, and there is not sufficient air space for the best results. Glass tanks made in one piece are apt to crack. If placed on a thick piece of felt the danger of breakage is lessened, but a rectangular container with metal corners is far better. These can be bought for as little as one dollar or less, but the cheaper ones have steel supports which will rust unless great care is taken to keep them wiped dry. Tanks with chrome steel or aluminum frames are somewhat more expensive, but are well worth the difference in cost because they do not rust.

Kinds of plants best adapted

After procuring the container, the next step is to decide on the type of plants to be grown. Do not mix woodsy material and house plants. Have one or the other, as the combination is unnatural and their needs are different. Wild things, such as mosses, ferns, lichens, creeping vines and various small flowers, are more interesting to most people. These natives of the woods are low-growing on the forest floor or on rocks where the soil is very rich but usually without much depth. Here it is damp and only a filtered light or a little sunshine sifts down through the tree tops. Most house plants, on the other hand, grow in a good garden loam, and require a warmer temperature than the wild ones.

A miniature piece of woods

In planting the terrarium it is well to remember that in the woods where these things grow it is not flat but hilly, with stones and cliffs rising up, fallen tree trunks covered with ferns, fungi and lichens, depressions carpeted with moss and dainty blossoming things. And so we should plan as natural a scene as possible.

A layer of fine clean gravel, about an inch thick in the front to two or more in the back, should be spread over the floor of the container to insure drainage. By sifting thoroughly-washed builders' sand the residue will form a good gravel foundation. A piece or two of charcoal placed in this layer helps to keep it sweet. The gravel should be heaped up in the back or at the ends to form a hill or slope and brought almost to the glass front. Over this foundation spread a layer of fine leaf mold or soil like that in which your plants have been growing. The soil need not be more than an inch in depth, except in the back where it is built up, or behind ledges or on sharp slopes. Next, place one or more irregular rocks where they will look like natural outcroppings or ledges.

Placing the foundation and soil

After the drainage layer and the leaf mold have been prepared, assemble the plants; lay them on top of the soil to get the picture of how they will appear when planted. When the arrangement is satisfactory, begin to plant.

Planting

Put the moss or ground cover in place and pat it down firmly. There will be enough soil adhering to it so that it will need nothing more. Tuck it down between the glass front of the container and the soil, so the latter will not show. The larger plants naturally go toward the back. With a sharp pointed stick or dibber, make holes through the moss, gently work the roots into the hole so formed, and with the fingers press the soil and moss around them. Arrange ferns and vines to fall over the ledges or to grow in the shadow of boulders. Smaller plants should be placed near the front of the terrarium. A piece of partly decayed wood with lichens on it can simulate a fallen tree trunk; and if the terrarium is large enough, there may be a small pool made by sinking a small glass or porcelain dish until the rim is flush with the mossy floor. Do not use tin of any kind, as it will rust and become unsightly.

A word as to the mosses to be used. They are of three types: those that form a perfectly flat carpet, among which are the fern mosses and many of the hypnums; those that grow in round cushions, such as the silvery white leucobryum or cushion moss; and those that grow in large, more upstanding patches, of which the tree moss (*Climacium*) is the loveliest. Others are the pigeon wheat (*Polytrichum commune*) and the juniper hair cap mosses (*Polytrichum juniperinum*). Get these in the fruiting stage, with the spore cases standing up, if possible. It makes for variety and interest to have one or more of each type, though the first is the best for the main floor covering.

Kinds of mosses to use

Ferns should be small and hardy; any that fulfill these requirements may be used. Perhaps the very best is the common polypody (*Polypodium vulgare*) which is easily collected in the form of tiny specimens up to any size that is desired. Small woodsia, (*Woodsia obtusa*), Christmas (*Polystichum acrostichoides*), oak (*Phegopteris dryopteris*), maidenhair (*Adiantum pedatum*), and beech (*Phegopteris polypodioides*) ferns are good, to mention a

few. If any of them grow too big they can easily be removed or cut off.

Tree seedlings

Seedlings of hemlock, pine, spruce, or fir will give height where needed. Pieces of lycopodium (*Lycopodium obscurum*) or "ground pine," as it is commonly known, look like thrifty evergreen trees. Deciduous tree seedlings, true to their habit out-of-doors, will drop their leaves. Yet, for a short time in the autumn, very small red maples are admirable material because they lend a wonderful touch of color to the scene. Tiny maples, birches, or oaks take up very little room. If placed in the terrarium at this time of the year, their buds begin to swell very early and the young leaves come out, showing that spring is on the way.

Color

The terrarium is predominantly green, but spots of vivid red may be furnished by the berries of wintergreen or partridge berry, the latter a satisfactory little vine that will root itself wherever it has a chance. Another vine-like plant growing on the forest floor is twin-flower, so named for the tiny twin pink flowers it bears in the summer.

Other plants

Pipsissewa or Prince's Pine is a coveted plant for the terrarium because of its lovely waxy flowers and handsome evergreen leaves; and equally good is the spotted wintergreen, its glossy beautiful green leaves marked with white. Another remarkably attractive foliage plant is the rattlesnake plantain, an odd little orchid whose green leaves, marked with white, form handsome rosettes.

There are many small flowering or foliage plants that may be added to this miniature woodland scene, such as little violet plants, miterwort, hepatica, anemone, mountain oxalis, dalibarda, and gold thread.

Fungi and lichens

Very small shelf fungi on pieces of dead wood, or little puff balls are attractive. Mushrooms, however beautifully colored, are definitely to be avoided, as they quickly decay, causing much trouble. Lichens, especially the cup cladonias and some of the leafy looking grayish-white parmelias, are good. The red cap cladonia, known as "British soldiers" adds a charming touch of color. While they may not last as long as some of the other green things, they can be easily removed without disturbing the rest. A small bit of one leafy liverwort may be tucked in a bare spot, but it is apt to grow very fast, taking up valuable space.

Watering

After the planting has been completed, it is time to water the terrarium. This should be done gently; never pour in a heavy stream of water. A small rubber bulb for watering plants is an excellent thing to use. The terrarium should be thoroughly watered but not soppy. It is a good plan to have a little water in the gravel layer, but the soil should be only damp, not wet. The glass cover of the container not only keeps the dust out and the temperature equable but holds the moisture in, so that it should not be necessary to water every

day. There is no hard and fast rule for watering; only by watching is it possible to keep the amount of moisture right. If a white or brown mold appears, or the plants begin to rot, there is too much water. In that case the cover must be removed for a time and the affected plants removed. If any of the plants begin to shrivel or look dry, sprinkle them well.

Animals in the terrarium

As a home for animal life, whether newts, toads, turtles, or small snakes, the terrarium is not to be recommended. In order to be interesting it must be crowded with growing plants, so that the space is restricted. Further, the animals are likely to uproot and destroy the plants. They must have food and water and room in which to burrow. It is therefore much better to have a specially prepared home for them.

Light

Almost all plants enjoy some sunlight, so the terrarium may be kept in a window having some sun during the winter months when there are so many gray days. If it gets too hot, move it back a little from the window front. It thrives better if kept cool. If no sunny window is available the terrarium will do as well or better in good diffused light. Because it responds so well to a little intelligent care, a terrarium is a source of endless pleasure.

Following is a list of plants suitable for a woodsy terrarium.

Ferns

Beech—Phegopteris polypodioides
Phegopteris hexagonoptera
Christmas—Polystichum acrostichoides
Maiden Hair—Adiantum pedatum
Oak—Phegopteris Dryopteris
Polypody—Polypodium vulgare
Woodsia—Woodsia obtusa

Mosses

Broom—Dicranum
Fern—Thuidium
Cushion—Leucobryum
Pinnate & Plume—Hypnums
Hair Cap—Polytrichum
Tree—Climacium

Lichens

Cup Cladonia—Cladonia fimbriata
Red-topped Cladonia—Cladonia cristatella
Parmelia—Parmelia
Reindeer Moss—Cladonia rangiferina

Club Moss

Lycopodium obscurum

Fungi

Shelf

Flowering Plants

Anemone—Anemone quinquefolia
Bunchberry—Cornus canadensis
Canada Mayflower—Maianthemum canadense
Dalibarda—Dalibarda repens
Cinquefoil—Potentilla sp.
Goldthread—Coptis trifolia
Hepatica—Hepatica triloba
Miterwort—Mitella diphylla
Oxalis (Wood Sorrel)—Oxalis Acetosella
Partridge Berry—Mitchella repens
Pipsissewa (Prince's Pine)—Chimaphila umbellata
Pussy's Toes—Antennaria sp.
Rattlesnake Plantain—Epipactis pubescens
Spotted Wintergreen—Chimaphila maculata
Shin Leaf—Pyrola sp.
Twin-flower—Linnaea borealis var. americana
Violet—Viola sp.
Wintergreen—Gaultheria procumbens
Wild Strawberry—Fragaria sp.

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